The Biological Weapons Threat and International Nonproliferation Programs

SNL Biosecurity Team

National Workshop on Biosecurity

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NNSA National Nuclear Security Administration

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Biological Weapons Nonproliferation (BWNP)

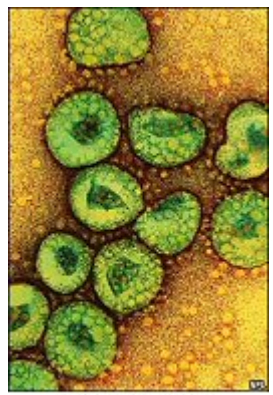
- An international strategy designed to prevent the use of biological weapons
- Current international BWNP Programs:
  - Support the Biological Weapons Convention
  - Export Controls
- Current programs address state based biological weapons (BW) proliferation
  - In addition, a pressing need to counter BW proliferation by terrorists, globally

Francisella tularensis

Evolution of the Biological Weapons Threat

- **Bioterrorism has emerged as a threat to international security**
  - **1984 Rajneeshee religious cult attacks**
  - **1990s Aum Shinrikyo attempts**
  - **2001 Anthrax attacks in the US**

- **Recent natural outbreaks of highly infectious disease awakened the international community to the potential consequences of bioterrorism**



SARS virus

- **The rapid expansion of biotechnology has facilitated efforts to acquire, develop, and deploy biological weapons (BW)**

Today, BW proliferation is a global problem that requires global solutions

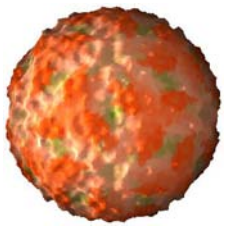
The BWC and Biosecurity

- **Bacteriological (Biological) and Toxins Weapons Convention (BWC) addresses three relevant issues**
  - **National Implementing Legislation**
  - **National Pathogen Security (biosecurity)**
  - **International Cooperation**

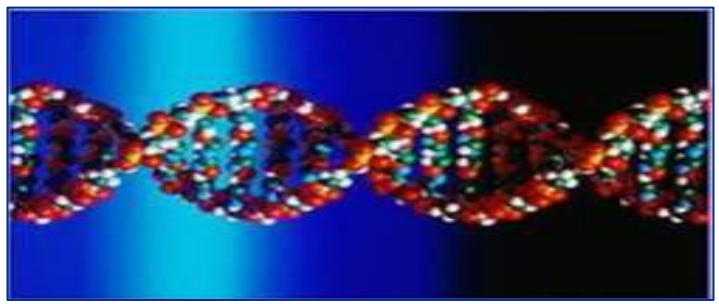
- **Recent technical experts meetings to strengthen the BWC**
  - **States Parties agree to pursue national implementation of laboratory and transportation biosecurity (2003)**

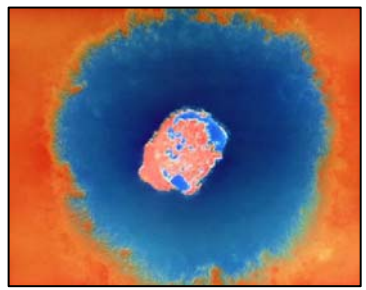
National Implementing Legislation

- **Article IV requires that each State Party enact implementing legislation for enforcement of the BWC**
- **Places an obligation on States to control misuse by both State agencies and non-state agencies within its jurisdiction or control**
- **May require modification of criminal code or other laws**



FMD virus





Smallpox virus

National Pathogen Security

- **Article II mandates States Parties to take appropriate measures to protect the public and the environment from dangerous biological agents**

- **Article III indicates that States Parties cannot provide resources to others to misuse biological agents**
  - **Obligates States Parties to use caution when transferring or sharing biological agents and toxins that could be used maliciously**
  - **Mandates that States Parties only transfer these agents for peaceful purposes and that those receiving them are known to be qualified to handle the agents**

- **Article VII compels States Parties to assist a State Party that has been harmed by the misuse of biological agents**
  - **Understanding that States Parties are responsible for the safety and security of their biological resources, and must attempt to ensure that other States Parties cannot be harmed by biological weapons**

International Cooperation

- **Article V sets a precedent for cooperation between nations in accomplishing the goals and objectives of the BWC**
  - **It recognizes the United Nations and its affiliate organizations, such as the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), as important players in engaging the Convention**
- **Article X indicates that all States Parties should cooperate and share information and biological agents to the degree possible without violation of other aspects of the BWC**
  - **Understanding that a State Party which requests biological agents be able to demonstrate that it is able to use the agents safely, securely, and legitimately**

Recommended Measures at the National Level

- **BWC Implementing Legislation that bans the development, production, and stockpiling of biological weapon agents, toxins, equipment, and means of delivery**
- **National Legislation for Laboratory and Transportation Biosecurity**
  - **List or methodology for identifying pathogens to be controlled**
  - **National authority to control dangerous pathogen use and to license facilities that use dangerous pathogens**
- **Biosecurity Implementation Standards or Guidelines**
  - **Provide assistance to those who handle, store, or transport dangerous pathogens so that they can comply with legislation while still meeting their biomedical and bioscience research and diagnostic obligations**
- **Coordination on these issues with relevant international organizations, such as WHO and FAO, and with other States Parties**

Challenges for BWNP

- **Terrorists no longer need sophisticated processing and dissemination systems to threaten international security**
- **Materials, technologies, and expertise are distributed among thousands of legitimate bioscience facilities worldwide**
- **Excessive controls on the biotechnology industry will jeopardize critical research without providing tangible security benefits**

Bacillus anthracis

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Global Biological Materials Management

- **Development of programs to secure *high risk agents* internationally**
  - **Implement systems and practices to promote the safe, secure, and responsible use of *high risk agents***

Elements of Global Biological Materials Management

1. **Agent Prioritization**
2. **Facility Biosecurity**
3. **Transport Biosecurity**
4. **Biosurveillance**
5. **International Outbreak Control**

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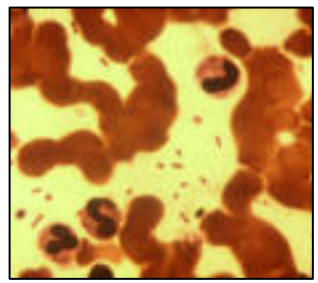
Biological Agent Prioritization

- **Identifies *high risk agents* through scientific analysis that evaluates weaponization potential and consequences of use**
  - **How attractive or valuable the agent would be to an adversary**
- **Allows policymakers to focus on securing the *highest risk agents***
  - **Optimizes allocation of resources**



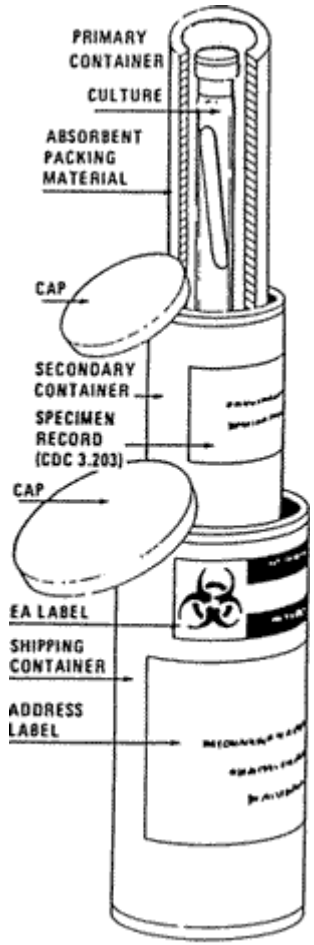
Yersinia pestis

Facility Biosecurity

- Secures *high risk agents* in facilities where they are used and stored
  - Aims to prevent terrorists or proliferant states from stealing or sabotaging *high risk agents*
- *High risk agents* are housed in thousands of legitimate facilities worldwide, and the biotechnology industry continues to expand
- Critical to develop systems that balance security and research
- Imperative to develop global biosecurity standards for facilities

Transport Biosecurity

- **Secures *high risk agents* during transport between facilities**
  - **Aims to prevent terrorists or proliferant states from acquiring dangerous biological agents through theft**
  - **Relies on chain of custody principles and end-user agreements**
  - **Added benefit – protects against sabotage**
- ***High risk agents* are routinely shipped worldwide for diagnostic and research activities**
  - **A local, national, and international concern**
- **Need to develop a common standard, harmonize regulations for security**



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Biosurveillance

- **Identifies international outbreaks of disease caused by *high risk agents***
  - **Monitors human, animal, and plant populations for signs of an outbreak**
- **Current lack of effective international surveillance systems to track disease outbreaks caused by *high risk agents***
- **Need to develop and network biosurveillance systems worldwide**
  - **Focus on regions prone to emerging disease outbreaks**

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International Outbreak Control

- **Controls *high risk agents* from the site of outbreak through diagnostic and clinical environments using decontamination, biosecurity, and quarantine procedures**

- **During outbreaks of highly infectious disease, mitigating public health impacts is the main priority**
  - **Yet also critical to ensure that materials are secured against theft**
  - **Crucial to establish security measures for international outbreak control**

Decontamination following an Ebola outbreak in Gabon

Conclusions

- **Bioterrorism is a problem of global proportions**
- **Collaborative efforts among the international community will be critical to achieve an effective response**
- **Global biological materials management can provide a critical supplement to existing BWNP and biodefense efforts designed to counter the overall BW threat**

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